

Measles: Key Facts and Questions & Answers

Health Care Providers

Key Facts

Measles, once a common childhood disease, is no longer endemic in the United States due to the successful implementation of this country's measles vaccination program. Prior to this program, 400–500 children in the U.S. died each year from measles, 48,000 were hospitalized, and another 1,000 developed chronic disability from measles encephalitis. Because the disease is still common in many countries of the world, measles still occurs in the United States due to importations of the disease from other countries. This can happen when visitors from other countries travel to the United States while infected with measles and when U.S. residents become infected while traveling overseas. To prevent measles infections, it is important to maintain high 2-dose measles, mumps, and rubella (MMR) vaccination coverage in the U.S. population through routine immunization.

The Advisory Committee on Immunization Practices (ACIP) recommends that children receive the first dose of MMR vaccine at 12–15 months of age and the second dose between 4 to 6 years of age (or no sooner than 28 days after the first dose). All school and college students should receive two doses of MMR vaccine. Some adults should also get MMR vaccine: in general, anyone older than 18 years of age who was born in 1957 or later should get at least one dose of MMR vaccine unless they can show they had the vaccine or measles disease or they have a blood test that shows they are immune to measles.

Questions & Answers

What is measles?

Measles is an acute, highly communicable disease caused by the measles virus (family, *Paramyxoviridae*; genus, *Morbillivirus*).

What are the symptoms of measles?

The illness begins with a prodrome of fever, cough, coryza (runny nose), conjunctivitis, and an erythematous maculopapular rash. Koplik's spots (tiny white/bluish-white spots surrounded by erythema) are often present on the buccal mucosa during the prodrome and are considered pathognomonic for measles. The characteristic rash, a blotchy red rash starting on the face and spreading to the rest of the body, first appears 3–7 days into the prodrome.

The disease can be severe, with the most frequent complications being diarrhea (8%), middle ear infection (7%–9%), and pneumonia (1%–6%). Encephalitis, frequently resulting in permanent brain damage, occurs in about 1 per 1000–2000 cases of measles. The risk of severe complications and death is higher among children younger than 5 and adults older than 20 years of age.

How is measles spread?

Measles is a highly contagious disease that is transmitted by direct contact with infectious droplets or, less commonly, by airborne spread. Measles virus can survive for 2 hours on environmental surfaces.

What is the incubation period for measles?

The incubation period of measles from exposure to rash onset is generally 14 days (range, 7–18). Patients are usually contagious from 4 days before until 4 days after the onset of the rash; thus, persons with measles can transmit the disease before knowing they are infected.

Is measles common in other parts of the world? What is the risk to US residents?

Measles remains a common disease in many countries of the world, including some developed countries in Europe and Asia. Worldwide, the World Health Organization estimates that more than 30 million individuals are affected each year by measles.

Since 1997, fewer than 150 cases of measles have been reported annually in the United States. The proportion of importation-associated cases increased from 59% of all reported cases in 1997 to 85% in 2004, and about half of all imported measles cases occur in U.S. residents returning from visits to foreign countries. To prevent getting measles from international visitors or from international travel, U.S. residents should be appropriately vaccinated (see the following two sections: At what age should children get the MMR vaccine? and Do adults need to be vaccinated against measles?).

Is there a treatment for measles infection?

There is no specific antiviral therapy for measles. Treatment is supportive, including hydration, controlling fever, and treating complications such as pneumonia. Vitamin A supplementation improves the outcome of measles among children with vitamin A deficiency and the [American Academy of Pediatrics](http://www.aap.org/) (or <http://www.aap.org/>) recommends vitamin A in certain circumstances.

How can children be protected against measles?

The best protection against measles for individuals and the community is through routine immunization with MMR vaccine. In almost all cases, people who receive the MMR vaccine are protected against measles. However, in rare cases, people who get the vaccine can still become infected with measles if exposed to the virus. Two doses of MMR vaccine provide full protection against measles to 99 out of every 100 persons vaccinated.

At what age should children get the MMR vaccine?

ACIP recommends the following dosing schedule for children less than 18 years of age:

- Routine dosing:
 - The first dose of MMR vaccine should be given at 12–15 months of age.
 - The second dose should be given between 4 and 6 years of age (or separated by at least 28 days from the first dose).
- Catch-up vaccination for un-immunized older children:
 - Two doses of MMR vaccine separated by at least 28 days.

Children aged 6–11 months may be eligible for vaccination if they are at elevated risk of measles either because of an ongoing outbreak or because of international travel. Such children should receive a dose of monovalent measles vaccine or MMR vaccine if monovalent vaccine is not available. Because immunity conferred by this dose may be lower, revaccination with two doses additional of measles-containing vaccine is recommended, the first of which should be administered at 12–15 months and the second no earlier than 28 days later.

Children younger than 6 months of age should not receive the measles vaccine.


Do adults need to be vaccinated against measles?

All U.S. adults can be presumed immune to measles if they have documentation of adequate vaccination, laboratory evidence of immunity to measles, documentation of physician-diagnosed measles, or were born before 1957. Those without evidence of immunity should be vaccinated with at least one dose of MMR vaccine. For certain groups of adults (e.g., health care providers), two doses of MMR vaccine are recommended.

In addition, all school and college students should receive two doses of MMR vaccine, and all U.S. residents aged 6 months and older traveling internationally, including to developed countries, should have evidence of measles immunity before they travel. More specific recommendations for vaccinating adults


can be found at CDC's [vaccination advice Web page](http://www.cdc.gov/vaccines/vpd-vac/measles/in-short-adult.htm#who) or <http://www.cdc.gov/vaccines/vpd-vac/measles/in-short-adult.htm#who>.

Are there people who should not get the MMR vaccine?

Some people should not receive MMR vaccine or should wait before being vaccinated. This includes persons with allergies to components of the vaccine and those with medical conditions that preclude vaccination. More detailed information is available in the [Vaccine Information Statement](http://www.cdc.gov/vaccines/pubs/vis/)  or go to MMR at <http://www.cdc.gov/vaccines/pubs/vis/>.

Is the MMR vaccine safe?

The MMR vaccine has been in use for more than three decades in the U.S., and reports of serious adverse events following vaccination have been extremely rare. As with all vaccines, there can be minor reactions from the MMR vaccine. These reactions might include pain and redness at the injection site, headache, fatigue, or a vague feeling of discomfort. When reports of severe vaccine-related adverse events are made, they are taken seriously and investigated appropriately.

The risk of MMR vaccine causing serious harm or death has been extremely small and that being vaccinated is much safer than getting any of the three diseases the vaccine protects against. Additional information about possible vaccine-related adverse events is available in the [Vaccine Information Statement](http://www.cdc.gov/vaccines/pubs/vis/)  or go to MMR at <http://www.cdc.gov/vaccines/pubs/vis/>.

Is there anything that can be done for unvaccinated people who have already been exposed to measles?

Measles vaccine may be effective if given within the first 3 days (72 hours) after exposure to measles. Immune globulin may be effective for as long as 6 days after exposure. More information on post-exposure prophylaxis for measles is available in the [ACIP recommendations](http://www.cdc.gov/mmwr/preview/mmwrhtml/00053391.htm) or <http://www.cdc.gov/mmwr/preview/mmwrhtml/00053391.htm>.

What should health care providers do if they suspect a case of measles?

Health care personnel providing care to suspected measles patients should apply appropriate isolation practices, including airborne precautions, in addition to standard precautions for such patients (details available in CDC's [Guideline for Isolation Precautions](http://www.cdc.gov/ncidod/dhqp/gl_isolation.html) or http://www.cdc.gov/ncidod/dhqp/gl_isolation.html). Health care personnel and visitors without evidence of immunity (documented administration of two doses of live measles vaccine, laboratory evidence of immunity, born before 1957, or documentation of physician-diagnosed measles) should be restricted from entering the rooms of patients known or suspected to have measles.

If you suspect measles in a patient, immediately isolate the patient and notify your local health department.

Additional information

The Centers for Disease Control and Prevention maintains a website with many informative articles and references on measles and the MMR vaccine. Several links are listed below.

CDC. [Epidemiology & Prevention of Vaccine-Preventable Diseases: The Pink Book](http://www.cdc.gov/vaccines/pubs/pinkbook/default.htm) at <http://www.cdc.gov/vaccines/pubs/pinkbook/default.htm>. National Immunization Program, CDC. 8th Edition, Feb 2004. (Chapter 10: Measles).

CDC. Measles, Mumps, and Rubella—Vaccine use and strategies for elimination of measles, rubella, and congenital rubella syndrome and control of mumps: Recommendations of the Advisory Committee on Immunization Practices (ACIP). [MMWR 1998;4\(No RR-8\);1–57](#) or <http://www.cdc.gov/vaccines/pubs/pinkbook/default.htm>.

MMR [Vaccine Information Statement](#)  or <http://www.cdc.gov/vaccines/pubs/vis/>

MMR [Vaccine Questions and Answers](#) for Clinicians or <http://www.cdc.gov/vaccines/vpd-vac/combo-vaccines/mmr/faqs-mmr-hcp.htm>

The [Measles: General Information](#) or http://www.cdc.gov/ncidod/dvrd/revb/measles/measles_general_info.htm page provides background and incidence information as links to other information, including laboratory tools.

The [Vaccines and Preventable Diseases: Measles Disease In-Short](#) or <http://www.cdc.gov/vaccines/vpd-vac/measles/in-short-adult.htm> page contains general information about measles, including a description of the disease, information about symptoms, complications, transmission, and the vaccine and who needs it.

The [Vaccines and Preventable Diseases: Measles Vaccination](#) or <http://www.cdc.gov/vaccines/vpd-vac/measles/default.htm> page contains general information about the disease, vaccination information, beliefs and concerns, vaccine safety, and who should not be vaccinated. It also contains more specific information for clinicians, including technical information, recommendations, references and resources, provider education, and materials for patients.

[Travelers' Health](#) or <http://wwwn.cdc.gov/travel/default.aspx>, including information for specific groups and settings.